THE COUNCIL FOR TOBACCO RESEARCH-U.S.A., INC.

110 EAST 59TH STREET
NEW YORK. N. Y. 10022
(212) 421-8985

Application for Research Grants
(Use extra pages as needed)

JUL 2 9 1974
Doie:

1. Principal Investigator (give title and degrees):

Victor Havlicek, M.D., D.Sc.

James C. Haworth, M.B., Ch.B., M.D.

Victor Chernick, M.D.

2. Institution & address:

University of Manitoba Winnipeg, Manitoba

3. Department(s) where research will be done or collaboration provided:

Department of Pediatrics, Health Sciences Centre 685 Bannatyne Avenue, Winnipeg, Manitoba, Canada

4. Short title of study:

Effect of smoking on the neonatal EEG and subsequent electrical and functional maturation of the brain.

5. Proposed starting date: January 1, 1975

网络人名 植物鱼 电气压强电气

- 6. Estimated time to complete: 2 years
- 7. Brief description of specific research aims:
 - 1) To determine whether smoking during pregnancy affects brain function at birth as judged by computer analyzed electroencephalography and to correlate the EEG obtained at birth with subsequent intellectual development.
 - 2) To determine whether the prognosis, in terms of physical growth, intellectual development and brain electrical activity of surviving children of women who smoked during pregnancy differs from that of children of non-smoking mothers. Also, to determine whether prognosis can be related to the number of cigarettes smoked or to carboxyhemoglobin content of the blood at birth.

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The association between cigarette smoking during pregnancy and fetal growth retardation has been firmly established although there may be an element of doubt whether this association is causal. The hypothesis that cigarette smoking interferes with brain growth in-utero and therefore subsequent electrical and intellectual development of the child will be tested in a prospective study.

9. Details of experimental design and procedures (append extra pages as necessary)

The Sample of Pregnant Women

The sample will consist of women attending the Women's Centre of the Health Sciences Centre, where there are nearly 4,000 deliveries a year. In order to interview women at several stages of pregnancy, it would be ideal to include the women who attend the prenatal clinic at the hospital. However these patients tend to be those in the lower socioeconomic catagories and so as to obtain a proper socioeconomic "mix" it will be necessary to include also women who receive their prenatal care at the offices of practising obstetricians. For practical reasons these women can be interviewed only once - while they are in hospital after the delivery of their babies. It is planned that the sample shall consist of 100 clinic patients and 100 postpartum patients.

The following information will be obtained:

1) Smoking History:

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Whether a smoker or a non-smoker, the amount of smoking according to the number of cigarettes smoked per day, change in smoking habits during pregnancy

2) Personal and Obstetric Data:

Age, height, pregravid weight, weight gain during pregnancy, ethnic origin, socioeconomic status (rated according to occupation of the woman or the husband) parity, past and present obstetric history.

The Sample of Infants

The following information will be collected about the infants born to the pregnant women studied: birthweight, gestation, crown heel length, head circumference, apgar score (1 minute and 5 minute), presence of major malformations (as defined by the Medical Records Department, Women's Centre), neonatal disorders. Still births and neonatal deaths will also be recorded.

Cord blood carboxyhemoglobin will be measured in as many babies as possible (those born during normal working hours). This estimation will be performed on the

I.L. CO-Oximeter at the Children's Centre.

The Follow-Up Study

A group of these infants will be selected for the follow-up study. At the moment it is planned to study 100 infants of smoking mothers and an equal number of infants of non-smokers (this is the maximum number that Dr. K. McRae, the Director of the Child Development Clinic, feels that his Department can accommodate). Infants will be selected for follow-up on the following basis:

- 1) The mother smoked more than 10 cigarettes regularly since the 4th month of the pregnancy.
- Follow-up is practical (family lives in or near Winnipeg).
- 3) The mother gives informed consent.

For each index infant selected for follow-up, a control infant will also be selected. The control infant will be the baby born to the next non-smoker who matches the index infant as closely as possible for sex, birthweight and gestational age, and age, parity and socioeconomic class of the mother (all factors which may affect developmental progress). If the mother does not give consent, or if follow-up is impractical, the next born suitable infant will be substituted.

The follow-up procedure for index and control infants will be as follows:

- the newborn period. Data on normal infants have already been collected (see appended manuscript). EEG's will be repeated at 6, 12, and 24 months of age.
- 2) Attendance at the Child Development Clinic at 6, 12 and 24 months of age. The following information will be documented at each visit: a) physical measurements weight, height, head circumference, b) neurological abnormalities, and c) developmental assessment (Yale Developmental Schedule based on Gesell early developmental testing technique).

Data Handling and Analysis

All data will be coded, punched on to computer cards and analyzed according to standard statistical techniques.

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10. Space and facilities available (when elsewhere than item 2 indicates, state location):

Space and facilities to undertake this study are available in the Health Sciences Centre. A fully-equipped experimental EEG laboratory is located adjacent to the newborn nurseries. A special Child Development Clinic has been in operation in the Centre since 1959 and they have agreed to undertake the follow-up studies.

11. Additional facilities required:

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12. Biographical sketches of investigator(s) and other professional personnel (append):

13. Publications: (five most recent and pertinent of investigator(s); append list, and provide reprints if available).

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	5.		
16. Other sources of financial suppor	sources, including own institution, for th	is and related research projects	
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